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THE LANGUAGE INSTRUCTOR AND TEACHING MACHINES.

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PROGRAMED LEARNING BASED ON CONTRASTIVE LINGUISTIC ANALYSIS CAN BE USED TO OVERCOME THE PREDICTABLE ERRORS MADE BY STUDENTS LEARNING A SECOND LANGUAGE. THE PROGRAM, WITH A LEARNING SEQUENCE ARRANGED SO THAT STUDENTS WILL AVOID MAKING ERRORS, CAN PROVIDE PRACTICE IN THE MECHANICS OF THE LANGUAGE, BUT IT HAS LIMITATIONS, FOR A STUDENT CANNOT ENGAGE IN COMMUNICATION WITH A MACHINE. THE TEACHER MUST SUPPLY THE CONDITIONS AND SITUATIONS IN WHICH STUDENTS, IN SMALL GROUPS, CAN NOT ONLY APPLY WHAT THEY HAVE LEARNED IN THE PROGRAMED PHASE, BUT ALSO COMMUNICATE AND CONVERSE WITH OTHER SPEAKERS OF THE FOREIGN LANGUAGE. THIS PAPER WAS READ AT THE SPRING CONFERENCE OF THE PSMLA (UNIVERSITY OF PITTSBURGH, MAY 14, 1966) AND WAS PUBLISHED IN "THE BULLETIN OF THE PENNSYLVANIA STATE MODERN LANGUAGE ASSOCIATION," VOLUME 45, NUMBER 1, DECEMBER 1966. (AM)

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THE LANGUAGE INSTRUCTOR AND TEACHING MACHINES

Theodore Mueller
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Why do Foreign Language students make mistakes?* Usually they repeat the same mistakes over and over again to the exasperation of every teacher. In my early teaching career I laid the blame on their inability to learn, their unwillingness to prepare their work properly at home, or sheer negligence. If they would pay attention to the rules, they wouldn't make such mistakes, was the argument.

A little introspection in the mistakes I made and still am making when speaking or writing English, which is a foreign language for me, leads me to question my former attitude. My mistakes in English furthermore are always the same. They are predictable: word order in the use of an adverb or tense usage. They occur where English and French conflict. In other words it is interference from my native language that causes these mistakes. Likewise the mistakes the students are making in a foreign language are entirely predictable. They occur wherever English conflicts with the structures of the new language.

Linguistic scientists propose to overcome this particular problem through overlearning. Once the conflicts have been carefully established, the new structures are drilled until they have been overlearned, or, in other words, until new language habits have been thoroughly established. This is the task Programmed Learning has set for itself.

A Foreign Language Program, in the technical sense, consists of a sequence of drills or exercises for which a contrastive linguistic analysis between the native and the foreign language forms the basis. In addition, the psychologists, particularly the learning theorists, have brought their know-how to bear upon these exercises.

A program is self-instructional. The sequence of the drills can not be left to the discretion of the instructor. Every single utterance that the student is to make is carefully placed so as to avoid errors. The most effective programs are controlled by machines, since only they present the stimuli in a predetermined order and are able to control everyone of the student's responses. Self-instructional therefore means that the teacher cannot rearrange the exercises, change them in any manner, or introduce other materials than the materials prescribed in that sequence.

What about the foreign language teacher? If a self-instructional Program is used, is the teacher replaced? Is the teacher no longer needed? These questions are not to be dismissed as rhetorical questions. The suggestion has been made and taken seriously that due to the poor preparation of many teachers it might be best to replace such teachers by a Program. It has been tried, and it is still being tried. I have tried it with my own students refusing to conduct a class. But I can assure you that the teacher is now needed more than ever before. I propose that in foreign language teaching of the future, the teacher will team up with the machine, or the Program, but will play the key role in this team. His role will be different, indeed from what it is now; he will succeed in the measure in which he understands his new role in this strange companionship.

The role of the self-instructional Program must be examined before we can suggest the new role that the future language teachers will play in the foreign language learning process.

The Foreign Language programmer views language as behavior in this approach to learning. To be sure, language in its elementary form only is the subject under discussion. Through conscious and very careful choice of vocabulary, grammatical constructions, and intonation, the gifted speaker can use language for special effects, to express shades of meaning, or to create works of art. Such use of language, however, is not considered here.

Pronunciation best illustrates the fact that language consists of habits. Nobody "thinks" about details of pronunciation when he speaks. The vocal cords and the muscles involved in producing the appropriate sounds are conditioned to behave automatically. The native speaker does not "think" about using the grammatical patterns of the language either. He unconsciously selects the various tenses and the proper word order and makes the necessary agreements while thinking about the content of what he wishes to say. The manipulation of grammatical patterns like pronun-

(cont. next page)

*This article was read as a paper under the announced title "The Role of the Teacher in a Self-Instructional Course" at the Spring Conference of the PSMLA at the University of Pittsburgh, May 14, 1966.

ciation, is a form of behavior to which he has been conditioned through years of practice.

The program is a means by which the new behavior is to be acquired by the learner. Specifically, the program aims at imparting to the learner the necessary pronunciation habits and the basic grammatical patterns of the language.

A program can explain just as well as a teacher can. The questions that the students will ask can be anticipated because they are questions arising from the conflict between the native and the target language. Step by step the student is to see how the foreign language operates.

The program can drill, and this is its most important function. If language is behavior, explanations are of minimal value. Habits are acquired through repeatedly doing the same act. A program provides the needed drill through its innumerable small exercises, each averaging two to three minutes. If needed the student repeats each exercise until he has mastered the material and then proceeds with the next one. The effectiveness of programmed exercises does not depend on this great number but on their arrangement. The sequence from one exercise to the next is so arranged that the student will make a minimum of errors. For repetition of an exercise eliciting mistakes does not lead to the desired behavior. The progression of difficulty from one exercise to the next must be so small that the likelihood of making an error is reduced to an absolute minimum. Only in this fashion can drills effectively lead to new habits.

But who will correct the student when he makes an error? Isn't this the teacher's primary function? The inability of the vast majority of our teachers to produce acceptable pronunciation among their students best refutes the argument about the value of correction by a teacher. The Program can and has overcome this problem. The student is first taught to discriminate between the correct and the incorrect utterance. This ability to discriminate serves two purposes: 1. the student learns first to hear the sound accurately before attempting to reproduce it; 2. he learns to listen to his own imitation and evaluate the accuracy of his pronunciation. As a result the student learns to correct his own pronunciation. Vocalization exercises which follow discrimination training are designed to help the student acquire the pronunciation habits.

Correction is made unnecessary if the vocalization exercises are properly constructed. Errors can be avoided by arranging the phonetic environment in which the sound is to be learned. The French /y/ sound will serve as an example. This sound when occuring in the word **Suzanne** is pronounced correctly much more frequently than in **tu** or **une.** This is due to the fact that Americans pronounce /t/ and /n/ with the tip of the tongue placed against the alveolar ridge, while /s/ or /z/ is pronounced with the tip of the tongue placed behind the upper front teeth. Thus /s/ and /z/ forces the student to place his tongue in the proper position for the /y/ sound. Furthermore associating /i/ and /y/ in minimal pairs such as **six, suce** will inevitably lead the student to get a feeling for /y/ sound. Gradually other phonetic surroundings are introduced until the /y/ sound is well established as a habit.

The effectiveness of a Program in the teaching of pronunciation is beyond question anymore. Just about every student can learn to pronounce French in an acceptable manner. Like pronunciation, effectiveness of a Program in acquiring the structure of the foreign language is clearly demonstrated particularly by students of low language aptitude. In a comparison with control sections several experimental sections taught through programmed learning demonstrated that in speech they used a much greater variety of structures and used them correctly.

A self instructional program has also limitations which must be clearly recognized for effective teaching. In the present state of the art, it is deficient in controlling oral production, nor can it teach the student to communicate with another human being.

The gifted and well motivated student learns easily to evaluate his own language production whether in pronunciation or grammatical structures. The program is very effective in giving him the necessary tools by which he decides whether he has achieved the skill necessary for taking the next step. The average student who usually lacks motivation is obviously more interested in completing the assignment than in learning the skill taught through the assignment. He always deludes himself about his knowledge being convinced that he does not need to repeat the exercise. The unmotivated student, of which we have so many, is most affected by these limitations. Such a student cares little about his mistakes, or about achieving the skill to be learned. Such a student needs the guidance, better the firm hand of the experienced teacher.

The student, who is taught through a Program only, fails to learn to converse with another human being. A machine cannot respond to the student's utterances; and no human being wants to talk to a machine. The program's objective, it must be remembered, is limited to the mechanics of the language, that is, the acquisition of pronunciation and the basic grammatical patterns, the forms of the verb, the word order in the sentence, the forms of the pronouns, adjective, etc. These elements are the basic skills necessary when one wishes to communicate with another human being. These are the only habits a Program can and intends to impart to the learner.

The teacher using a Program will assume the functions which he, as a human being, can best fulfill, and which the machine cannot. He, and only he, can motivate his students, and induce them to put forth the necessary effort to learn. Only he can teach them the art of communicating with other speakers of the foreign language. These are the two primary functions he must assume so that the Foreign Language Program can accomplish its specific function.

Motivating the student is the teacher's first function. This, of course, has always been his role. The teacher establishes what is called classroom dynamics, a somewhat elusive entity. Whatever it is, it serves as a means by which he induces his students to study, and he communicates to them his enthusiasm for the language, the culture and the foreign people. He rewards students through praise, or a smile; he shows an interest in them and in their progress; he tells each what he needs to review or where he needs to put forth an effort. In this manner he fulfills a very important function. The student, furthermore, needs to be reassured that he is learning. The fact that he performs well with the exercises in the laboratory does not convince him that he is acquiring French. He wants to hear from his teacher that he is making progress. The classroom also establishes an atmosphere of competition among students. In this small social circle each student aspires at and wants to maintain a certain position among his class mates. He wants to know whether the other class members have the same difficulties with certain topics and make similar mistakes. In general he wants to feel that his learning experience is similar to that of all the others.

The regularly scheduled class meetings also impose a certain discipline by providing weekly or daily assignments and dividing the task into short-range goals and measurable achievements. Were it left to our students the majority would try to learn the semester's work the week before the examination. Learning discipline is maintained by administering daily or weekly tests, by class recitations and the like. Our educational system has so conditioned our students that these pressures have become necessary—a sad commentary on our school system, indeed. Only those assignments in which they will have to recite the following day seem worthy of their attention. A test, furthermore, administered by machine is in the student's opinion not a test. It is a test only when done in competition with the other students in a classroom under certain controlled conditions. The discipline thus established is in a sense a form of motivation and part of the class dynamics.

The importance of the classroom conditions becomes evident to anyone who has used a Program without them. Even older and more mature students have expressed how much they missed the classroom atmosphere in a trial-use of the French Program in which no class sessions were held. Very few individuals are so highly motivated that they will learn by themselves and for their own pleasure. The vast majority of our students need the firm hand of discipline as well as the other class conditions which combined produce enthusiastic learners.

Teaching, which in Webster is defined as bringing out latent capacities of the student, remains the second and no doubt main function of the teacher. He teaches the art of communicating in the foreign language, a function to which he now may aspire, but for which so little if any time is left. The students' inability to communicate is the main complaint of the critics of the audio-lingual method, a complaint that is well justified. Except for repeating the sentences that have been memorized in dialogs, most students cannot converse in the Foreign Language, and that in spite of the great emphasis on audio-lingual work.

Language is a means of communication and its first and foremost purpose. Everybody agrees with that statement. But communication itself must be learned as a separate process after having learned vocabulary and the grammatical patterns. The situation is analogous to playing an instrument. The student who has learned to play scales, must also learn to play a piece of music or a tune, for a melody consists not only of notes. Thus communication is an essential part of the learning process itself.

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The teacher must provide the conditions and situations whereby communication in the foreign language takes place. Freed from explaining and drilling he will concentrate on the communication aspects, namely the two skills of listening and conversing.

Listening, or audio-comprehension, is the first step in the process of communication. It is more than being able to hear words and grammatical patterns. Even if the student knew all the vocabulary items and patterns he still would not be able to understand the foreigner speak. The cultural context among other things, is one of the missing elements. Whatever else constitutes listening comprehension, this skill must be practiced. The student must be exposed to situations where he hears someone else speak to him and transmit information. Films could be used for that particular purpose, to some extent at least. The skilled teacher, however, can do much better. Only he can sense whether the audience understands, whether he can proceed, or whether he has to repeat a sentence or possibly say it with more familiar vocabulary or simpler sentence patterns. Lectures in the foreign language illustrated by slides are ideally suited to captivate the students' attention. The presentation can be interspersed with questions to determine whether they understand or not.

Conversing in the foreign language is the second element of the communication function. Listening comprehension is the first step, which leads the student just half way towards the goal of communication. Conversing is a two-way street in which two individuals exchange ideas or react to each other's utterances. The classroom must now provide the opportunity for conversation either between two students or between the student and his teacher. What has been learned in the laboratory through pattern drills is now put to use in a practical communication situation.

The ability to converse is taught through a series of graded steps. The teacher provides the opportunity to apply the basic language patterns under controlled conditions. The class session must lead the student from automatic repetition to meaningful use and variations of the patterned utterances in conversational context. For this purpose, situations are imagined in which two students converse under the watchful ear of the instructor. At first these situations are rigorously structured and follow a well outlined sequence of patterns as illustrated herewith:

Stimulus given by the instructor: Demandez-lui s'il a mangé.

First student asks: Est-ce que vous avez mangé?

Second student replies: Non, je n'ai pas mangé.

This type of drill is not new. It is, however, a meaningful situation that may occur anytime and anywhere. This structured question and answer can be expanded into a little chain in which every pattern is predetermined:

Inst.: manger
A.: Est-ce que vous avez mangé?
B.: Moi, oui, j'ai mangé. Et vous?
A.: Moi, je n'ai pas mangé.
Mais je vais manger.
B.: Et les enfants, est-ce qu'ils ont mangé?
A.: Non, ils n'ont pas mangé.
Mais ils vont manger.

Other expressions can easily fit into this sequence of patterns: étudier, faire les devoirs, aller en ville, aller a l'école, visiter le musée etc. The variations are endless depending only on the number of structures that have been mastered in the laboratory.

Progressively the student is given more freedom of expression. While the sequence of patterns is still rigidly prescribed, the student can make his own choice of vocabulary as illustrated:

Inst.: Demandez-lui s'il a mangé.
A.: Est-ce que vous avez mangé?
B.: Oui, j'ai mangé.
A.: Quand est-ce que vous avez mangé?
B.: J'ai mangé . . . (ce matin, a 8 heures, etc.)

As the student gains in skill he supplies more and more information.

Inst.: boire:
A.: Qu'est-ce que vous buvez?
B.: Je bois . . . Et vous?
A.: Je vais boire. . . .

Likewise freedom in structure is gradually allowed. The student may be given a choice to answer either with the positive or negative, the present, past or future etc. The student may be required to use in his second reply the tense that his partner used just before:

Instr.: étudier.

sequence 1

A.: Est-ce que vous étudiez?
B.: Non, j'ai déja étudié.
A.: Quand est-ce que vous avez étudié?
B.: J'ai étudié ce matin.

sequence 2

A.: Est-ce que vous étudiez?
B.: Non, mais j'étudierai.
A.: Quand est-ce que vous étudierez?
B.: J'étudierai ce soir.

Such "chained drills" require careful preparation on part of the instructor to avoid placing the student into a situation requiring structures he has not yet learned. However, the instructor's imagination is the only limit to these conversations.

Dialogues can be used as model conversations for practice in class. At first the students repeat the conversation as closely as possible, then supply other vocabulary items into the same framework, and finally will enjoy a free-for-all in which they are allowed to imagine anything they can express correctly.

The teacher in his new role of teaching the communicative skill needs a high level of proficiency in the language. Professor Valdman at the University of Indiana reports in the evaluation of his own French program the need of such high competency. I quote from his report, "Natural conversation requires spontaneous and rapid fire reactions among interlocutors. If the instructor is to involve the student in some sort of conversational ability and bring them to behave the language as they speak, he must produce sentences at a rapid rate that demands automaticity of generation. Unless the instructor has previously acquired the ability to generate grammatically correct and stylistically congruent sentences and only these sentences, and this represents a high level of achievement indeed, he will provide incorrect models for student analogies, and teach Franglish." Professor Valdman stipulates as the minimum requirements for such a teacher: good pronunciation, the ability to generate with automaticity, grammatically correct and stylistically appropriate sentences in the target language. A working knowledge of the structures of both the native and target languages, moderate wit, and good humor, and the ability to interact and empathize with students.

My own French program envisages graduate students as its instructors, that is, young people without teaching experience. For them a teacher's manual is being prepared in which every step is carefully outlined and prescribed. Such a manual can furnish the conversation models and prescribe the stimuli to be used but can never provide the language proficiency mentioned by Professor Valdman: a good pronunciation, a natural and automatic proficiency of the grammatical structures. These prerequisites will be key factors if these young people are to be successful with the program.

The new role assigned to the teacher makes much more use of the teacher's talents than has been the case up to now. It assigns to him and to him only the process of making what the language really is, a means of communication. The machine assumes those functions which it can do well, explaining and above all, drilling. The teacher, however, must assume those functions for which he alone is qualified as a human being, the art of conversing and the ability to communicate in the foreign tongue. If he does that, he will motivate his students to a degree he has never achieved before.

Conclusion

In fulfilling his future role, will this teacher teach a class as it is known today or instruct small groups of two or three students? The new experiments have tried to limit the size of a group to two or three students believing that the small group is necessary in order to engender genuine conversation. These experiments have also revealed however, that the student doesn't like to meet in such a small group; he prefers classes resembling the normal class to which he is accustomed. It will also be hard to convince administrators that such small groups are economically feasible.

The new class will look differently and will be at first bewildering. In it a teacher will not interact with a given student while 20-25 others listen, but the entire class will be divided into groups of two or three students. They will carry out the conversations for which the teacher has given the model. For the first time all students are talking constantly during a given class period while the teacher spends most of his time listening, the reverse of what the classroom situation is today. The student will come to class to use the language with his fellow students, to communicate with them. By doing this, the learner will acquire the skills that the class intends to make active.

Will the teacher, then still be needed? More than ever! However only the competent teacher will be able to fulfill the new functions.

ESPERANTO MASS OKD

VATICAN CITY (AP)—Pope Paul VI has given permission for limited use of Esperanto—the artificial language devised in 1887 for international use—in the Roman Catholic Mass. He ruled it could be used only in connection with Esperanto conventions.

(Harrisburg Patriot, July 20)

VOCABULARIES OF CHILDREN

UNIVERSITY PARK, Pa. (AP)—A recent study of vocabulary words used by beginning readers in speaking and in reading disclosed that the youngsters used 2,239 words when speaking that there were only 705 words in their reading books. The two lists had only 458 words in common.